



6712-01

FEDERAL COMMUNICATIONS COMMISSION

47 CFR Parts 2, 25 and 30

[GN Docket No. 14-177; FCC 19-30]

Use of Spectrum Bands above 24 GHz for Mobile Radio Services

AGENCY: Federal Communications Commission.

ACTION: Final rule.

SUMMARY: In this document, the Federal Communications Commission (Commission or FCC) adopts rules for specific millimeter wave bands above 24 GHz in the Fifth Report and Order. The Commission takes two actions that continue its efforts to make available millimeter wave (mmW) spectrum, at or above 24 GHz, for fifth-generation (5G) wireless, Internet of Things, and other advanced spectrum-based services, including satellite broadband services. First, the Commission establishes rules to allow Fixed-Satellite Service (FSS) operators such as satellite broadband service operators, to operate with individually licensed earth stations transmitting in the 50.4–51.4 GHz band using criteria identical to those applicable in the 24.75–25.25 GHz band. Second, the Commission establishes a process for the Department of Defense (Department) to operate on a shared basis in the Upper 37 GHz band (37.6–38.6 GHz band) in limited circumstances.

DATES: Effective [INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

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Albuquerque of the International Bureau, Satellite Division, at 202-418-2288 or Jose.Albuquerque@fcc.gov. For information regarding the PRA information collection requirements contained in this PRA, contact Cathy Williams, Office of Managing Director, at (202) 418-2918 or Cathy.Williams@fcc.gov.

SUPPLEMENTARY INFORMATION: This is a summary of the Commission's Fifth Report and Order GN Docket No. 14-177, FCC 19-30, adopted on April 12, 2019 and released on April 15, 2019. The complete text of this document is available for public inspection and copying from 8 a.m. to 4:30 p.m. Eastern Time (ET) Monday through Thursday or from 8 a.m. to 11:30 a.m. ET on Fridays in the FCC Reference Information Center, 445 12th Street S.W., Room CY-A257, Washington, DC 20554. The complete text is available on the Commission's Website at <https://docs.fcc.gov/public/attachments/FCC-19-30A1.pdf>, or by using the search function on the ECFS Web page at <http://www.fcc.gov/cgb/ecfs/>. Alternative formats are available to persons with disabilities by sending an e-mail to fcc504@fcc.gov or by calling the Consumer & Governmental Affairs Bureau at (202) 418-0530 (voice), (202) 418-0432 (tty).

Final Regulatory Flexibility Analysis

The Regulatory Flexibility Act (RFA) requires that an agency prepare a regulatory flexibility analysis for notice and comment rulemakings, unless the agency certifies that "the rule will not, if promulgated, have a significant economic impact on a substantial number of small entities." Accordingly, the Commission has prepared a Final Regulatory Flexibility Analysis (FRFA) concerning the possible impact of the rule changes contained in this Fifth Report and Order on small entities.

Paperwork Reduction Act

The requirements in revised § 25.136 (e), (f), and (g) constitute new or modified collections subject to the Paperwork Reduction Act of 1995 (PRA), Public Law 104-13. They will be submitted to the Office of

Management and Budget (OMB) for review under section 3507(d) of the PRA. OMB, the general public, and other Federal agencies will be invited to comment on the new information collection requirements contained in this proceeding. This document will be submitted to OMB for review under section 3507(d) of the PRA. In addition, the Commission notes that, pursuant to the Small Business Paperwork Relief Act of 2002, the Commission previously sought, but did not receive, specific comment on how the Commission might further reduce the information collection burden for small business concerns with fewer than 25 employees. The Commission describes impacts that might affect small businesses, which includes more businesses with fewer than 25 employees, in the Final Regulatory Flexibility Analysis. In the present document, the Commission has assessed the effects of its filing requirements on satellite providers and finds that these requirements will not impose undue burdens on businesses with fewer than 25 employees. The filing requirements the Commission is imposing are necessary to ensure that the proposed operations will comply with the technical rules the Commission has established and not unduly preclude possible future terrestrial operation in the band.

Congressional Review Act

The Commission will send a copy of the Fifth Report and Order, including this FRFA, in a report to Congress and the Government Accountability Office pursuant to the Congressional Review Act, see U.S.C. 801(a)(1)(A).

In addition, the Commission will send a copy of the Fifth Report and Order, including this FRFA, to the Chief Counsel for Advocacy of the SBA. A copy of the Fifth Report and Order, and FRFA (or summaries thereof) will also be published in the Federal Register.

I. INTRODUCTION

1. The Commission takes two actions that continues its efforts to make available millimeter wave (mmW) spectrum, at or above 24 GHz, for 5G wireless, Internet of Things (IoT), and other advanced spectrum-based services, including satellite broadband services. First, the Commission establishes rules authorizing FSS operators such as satellite broadband service operators, to license

individual earth stations in the 50.4-51.4 GHz band using criteria identical to those applicable in the 24.75-25.25 GHz band. This action will allow FSS operators to provide additional capacity that can be used to provide faster and more advanced services to their customers. Second, the Commission establishes a process for the Department of Defense (Department) to operate on a shared basis in the Upper 37 GHz band (37.6-38.6 GHz) in limited circumstances. This action will provide certainty to potential applicants as the Commission begins the auction process for the Upper 37 GHz band, the 39 GHz band (38.6-40 GHz band), and the 47 GHz band (47.2-48.2 GHz) later this year.

II. BACKGROUND

2. On June 8, 2018, the Commission released the Third Report & Order (Third R&O), 83 FR 34478, Memorandum Opinion and Order (MO&O), and Third Further Notice of Proposed Rulemaking (Third FNPRM), 83 FR 34520, in this proceeding. In relevant parts, the Third FNPRM proposed permitting the licensing of individual FSS earth stations in the 50.4-51.4 GHz band using criteria identical to those applicable in the 24.75-25.25 GHz band. With respect to the 37 GHz band, the Commission noted that it had adopted rules that establish coordination zones for 14 military sites and three scientific sites identified by the National Telecommunications and Information Administration (NTIA), and it sought comment on “on how best to accommodate coordination zones for future Federal operations at a limited number of additional sites.” In contrast, for the Lower 37 GHz band, the Commission sought comment on a proposed coordination mechanism and alternatives to facilitate co-equal shared use of the Lower 37 GHz band between Federal and non-Federal users, as well as among non-Federal users.

3. The 50.4-51.4 GHz band includes primary Federal and non-Federal allocations for fixed and mobile services, as well as primary Federal and non-Federal allocations for fixed-satellite (Earth-to-space) and mobile satellite (Earth-to-space) services. In 1998, the Commission designated the 50.4-51.4 GHz band for use by wireless (fixed and mobile) services. In the Spectrum Frontiers FNPRM, 81 FR 79894, the Commission proposed to authorize fixed and mobile operations throughout the 50.4-52.6 GHz band in accordance with the part 30 Upper Microwave Flexible Use Service (UMFUS) rules. The

Commission also proposed to use geographic area licensing to license UMFUS stations in the band on a Partial Economic Area (PEA) basis and sought comment on sharing with satellite services. The Commission received ten satellite applications or market access requests and 20 earth station applications seeking to use the existing FSS (Earth-to-space) allocation in the 50.4-51.4 GHz band for delivery of broadband services.

4. In the Third FNPRM, the Commission proposed rules that would permit licensing of individual FSS earth stations in the 50.4-51.4 GHz band using criteria identical to those applicable in the 24.75-25.25 GHz band. Specifically, the Commission proposed to apply the permitted aggregate population limits within the specified earth station Power Flux Density (PFD) contour on a per-county basis, similar to the requirement in the 27.5-28.35 GHz band, and to adopt constraints on the number of permitted earth stations on both a per county and a per PEA basis. To reflect these requirements, the Commission proposed to modify § 25.136 of the Commission's rules to include the 50.4-51.4 GHz band. The Commission also proposed to amend footnote NG65 to the U.S. Table of Allocations to include the 50.4-51.4 GHz band, making clear the relative interference protection obligations between the co-primary services.

5. With respect to the Upper 37 GHz band, the entire 37 GHz band is allocated to the fixed and mobile services on a primary basis for Federal and non-Federal use. In the Spectrum Frontiers R&O, 81 FR 79894, the Commission made five decisions addressing the Federal and non-Federal use of the band that are relevant here. First, it adopted service rules to permit non-Federal fixed and mobile terrestrial operation throughout the 37 GHz band. Second, it divided the band into two segments: a lower band segment from 37.0-37.6 GHz (Lower 37 GHz band) and an upper band segment from 37.6-38.6 GHz (Upper 37 GHz band). Third, it made the Lower 37 GHz band available for coordinated co-primary sharing between Federal and non-Federal users. Fourth, it adopted rules to license the Upper 37 GHz band geographically by PEAs in 200 megahertz channel blocks (but changed the band plan to 100 megahertz blocks in the Spectrum Frontiers Fourth R&O, 84 FR 1618). Fifth, it established the

coordination zones throughout the entire 37-38.6 GHz band for the 14 military sites and three scientific sites identified by NTIA. While the Commission noted that Federal agencies still had the ability to add future sites on a coordinated basis, it did not indicate how this could be done.

6. In the Third FNPRM, the Commission sought comment on how best to accommodate coordination zones for future Federal operations at a limited number of additional sites. The Commission asked whether it should amend its rules to add more specific sites for Federal operations, or whether it should establish a process that would permit Federal entities in the future to identify a limited number of additional sites on an as-needed basis. The Commission also asked whether the coordination zones previously established in its rules might be reduced to better accommodate nearby non-Federal operations without adversely impacting Federal operations at those sites.

7. The Commission received 26 comments and 17 reply comments on the Third FNPRM. A list of commenters, reply commenters, and parties filing ex parte submissions relating to the issues are addressed in this Fifth Report and Order. No petitions for reconsideration of the Third R&O were filed.

III. DISCUSSION

A. 50.4-51.4 GHz Band

8. AT&T, Boeing, EchoStar, SES, SpaceX, Telesat, TIA, and Viasat, support licensing of individual FSS earth stations in the 50.4-51.4 GHz band. Although not specifically opposed to the idea of allowing earth stations to operate in the 50.4-51.4 GHz band, CTIA, Nokia, and T-Mobile argue that it is premature to adopt rules for sharing between terrestrial and FSS operations before UMFUS service rules are adopted. They urge the Commission to adopt UMFUS service rules either first or simultaneously. In contrast, most satellite operators, asserting that there is no need to delay adopting FSS earth station sharing rules, point to workability in other bands, imminent plans for 50.4-51.4 GHz band satellite deployment, and the need to alleviate the current regulatory uncertainty, which the operators describe as debilitating, particularly given the high cost and long lead time involved in designing and building next-generation satellites. EchoStar and Boeing further encourage the Commission not only to swiftly

adopt the proposed rules, but also to proceed with processing pending earth station applications in this band conditioned upon the outcome of the proceeding.

9. With respect to the terms under which the 50.4-51.4 GHz band would be made available for individually licensed earth stations, there is a split between commenters who support using the same criteria applicable in the 24.75-25.25 GHz band and those who ask the Commission to adopt more permissive criteria. EchoStar, TIA, and AT&T support the criteria contained in the Third FNPRM, which would allow up to three earth station locations in a given county and a maximum of 15 earth station locations in a given PEA. AT&T, in addition, expressly opposes any relaxation in sharing criteria proposed in the Third FNPRM, asserting a lack of evidence and justification for disturbing the existing balance between services achieved by the rules introduced in other bands. T-Mobile similarly cautions that the Commission should go no further than the current sharing framework adopted for the 24 GHz band, which it characterizes as a consistent approach across already allocated bands. In contrast, Boeing, SES, SpaceX, and Telesat ask the Commission to adopt more permissive or flexible sharing criteria than the Commission proposed, and they assert that the shorter propagation distances of the 50.4-51.4 GHz band make it suitable for more robust sharing. Similarly, Viasat supports individual licensing of earth stations in the 50.4-51.4 GHz band consistent with the more liberal sharing framework applicable in the 47.2-48.2 GHz band, and it further asks the Commission to clarify that smaller earth stations may be permitted to operate in the 47.2-48.2 GHz and 50.4-51.4 GHz bands on a secondary basis with respect to terrestrial services. Other parties request that the Commission add an allocation for FSS in the 51.4-52.4 GHz band. CCA contends that the Commission should not adopt rules that could prejudice future mobile use.

10. The Commission adopts its proposal to permit licensing of individual FSS earth stations in the 50.4-51.4 GHz band using the criteria the Commission adopted for the 24.75-25.25 GHz band. This action will allow FSS operators to provide faster and more advanced services to their customers. Under those criteria, there may be no more than three earth stations in the 50.4-51.4 GHz band in a

county and no more than 15 earth stations in any PEA. The area in which the earth station generates a PFD, at 10 meters above ground level, of greater than or equal to $-77.6 \text{ dBm/m}^2/\text{MHz}$, together with the similar area of any other earth station operating in the 50.4-51.4 GHz band in the same county, may not cover, in the aggregate, more than the amount of population specified below:

Population within the County where earth station is located	Maximum permitted aggregate population within $-77.6 \text{ dBm/m}^2/\text{MHz}$ PFD contour of earth stations
Greater than 450,000	0.1 percent of population in county.
Between 6,000 and 450,000	450 people.
Fewer than 6,000	7.5 percent of population in county.

Furthermore, the area in which the earth station generates a PFD, at 10 meters above ground level, of greater than or equal to $-77.6 \text{ dBm/m}^2/\text{MHz}$ may not contain any major event venue, urban mass transit route, passenger railroad, or cruise ship port. In addition, that area shall not cross any of the following types of roads, as defined in functional classification guidelines issued by the Federal Highway Administration: Interstate, Other Freeways and Expressways, or Other Principal Arterial.

11. Although the 50.4-52.6 GHz band remains under consideration for UMFUS licensing, establishing UMFUS service rules will require us to address issues concerning sharing with co-primary Federal services in the 50.4-52.6 GHz band, as well as protection of passive services in the adjacent 50.2-50.4 GHz and 52.6-54.25 GHz bands. In the meantime, the Commission notes that a significant number of FSS operators seek to license space stations and earth stations in the band. As in the case of other bands shared between co-primary terrestrial and fixed-satellite services, (e.g., 24.75-25.25 GHz, 37.5-40 GHz and 47.2-48.2 GHz), the Commission finds that, where an FSS allocation already exists in the 50.4-51.4 GHz band, a limited number of individually licensed FSS earth stations can share the 50.4-51.4 GHz band with minimal impact on terrestrial operations in this band. Both the 24 GHz and 50 GHz bands are

satellite uplink bands. As in 24 GHz, the limits, the Commission will impose on FSS earth stations in the 50 GHz band will “better provide FSS with additional capacity for satellite services while permitting substantial terrestrial use of the band.” Throughout this proceeding, the Commission has sought to promote spectrum efficiency by permitting spectrum made available for UMFUS to be shared with other allocated services when possible. The Commission recognizes there are a significant number of pending FSS earth station applications for the 50.4-51.4 GHz band. The Commission agrees that operators in this co-primary service seeking to proceed with system development need this degree of regulatory certainty and should not have to wait while the more complex issues associated with UMFUS licensing are addressed and resolved. Thus, the Commission adopts the proposed rules, which will facilitate sharing between FSS and UMFUS, while the Commission continues to consider the rules for terrestrial operations in the band.

12. At this time, the Commission will not adopt any of the various proposals for increased flexibility for FSS earth station licensing. The Commission recognizes the differences in propagation characteristics between the 50 GHz band and lower frequency bands,¹ but the Commission concludes that, prior to the adoption of UMFUS licensing rules, it would be premature to extend FSS earth station flexibility beyond the more conservative limits adopted in the 24.75-25.25 GHz band. Accordingly, the Commission modifies § 25.136 of its rules to include the 50.4-51.4 GHz band, thereby applying the identical licensing criteria to these FSS earth stations as are applicable to those in the 24.75-25.25 GHz band. The Commission also makes a minor conforming modification to § 25.130(b)(4) to include this newly modified rule section in the list of rule sections with which FSS transmitting earth station applicants must comply when seeking authorization in bands shared with UMFUS. In addition, the

¹ Radio signals in the 50 GHz band are more subject to attenuation from oxygen and water vapor than signals in the 24 GHz band. Thus, all other things being equal, radio signals in the 50 GHz band will not travel as far as signals in the 24 GHz band.

Commission amends footnote NG65 to the U.S. Table of Allocations as proposed to include the 50.4-51.4 GHz band, making clear the relative interference protection obligations between the co-primary services.

B. Federal Sites in 37-38.6 GHz

13. In response to the Third FNPRM, NTIA, on behalf of the Department, has identified one additional Federal site in the Upper 37 GHz band beyond the 14 military sites and three scientific sites identified in the Commission's rules. Specifically, it requests a small coordination zone around Edwards Air Force Base to the south of Federal facilities in China Lake, California. In addition, NTIA requests the conversion into a single area of the four overlapping coordination zones currently listed in the Table under the China Lake site. NTIA indicates that these changes would simplify the Table to ensure sufficient protection is available for the Department's operations in the China Lake coordination area, as well as ensuring sufficient protection for nearby Edwards Air Force Base, without impacting any Upper 37 GHz licensees' access to the surrounding population centers in southern California. The Commission amends the Table to consolidate the China Lake coordination zones and accommodate Edwards Air Force Base.

14. Further, the Department expects to deploy at additional sites in the future, and the lower 37 GHz band (37.0–37.6 GHz) may not be sufficient. Because of the Commission's forthcoming plans to auction spectrum in this band before the end of the year and because failure to address possible coordination with Federal users could create uncertainty for potential non-Federal bidders in the auction for spectrum in the Upper 37 GHz band, the Commission believes it's critical to address these needs for coordination here.

15. The Commission recognizes that 5G and other advanced technologies will support a wide variety of applications, including applications that can be used by Federal users. Although the Commission's rules identify the current military sites where licensees would be required to coordinate within a distance of 30 kilometers, the Department expects that there likely will be additional sites

where it will need to use the band, but the Department cannot specifically identify these other locations at this time. Unlike the current sites where non-Federal licensees must coordinate with the Department of Defense, the Department seeks to coordinate its use of these additional sites with non-Federal licensees.

16. Accordingly, the Commission establishes a process that accommodates the military's needs, while protecting the interests of non-Federal licensees in the Upper 37 GHz spectrum band. The Department may submit requests for access to the Upper 37 GHz band for specific additional military bases and ranges, for the purpose of defense applications or national security. Such requests must include a justification regarding why the proposed operations could not be accommodated in the Lower 37 GHz band. The Department is willing to limit its requests to operations that cannot be accommodated in the Lower 37 GHz band. FCC staff will review the request to assess any potential impact on non-Federal licensees, contacting the potentially affected licensees and facilitating direct coordination with the Department and NTIA (including establishing a mechanism for appropriate notice to prospective future successors-in-interest to the affected licensees). The FCC will determine whether the request for access can be accommodated without creating a significant risk of harmful interference to current or planned deployments by potentially affected non-Federal licensees. NTIA would provide the applicable military departments any new or revised frequency assignments that are successfully coordinated. The Commission finds that this process strikes a reasonable balance among the stakeholders.

17. The Commission recognizes the concerns of commenters that increasing the number of Federal sites in the Upper 37 GHz band, or establishing a process for future Federal sites that lacks sufficient certainty, might negatively affect an auction of the Upper 37 GHz band and the value of the spectrum. The Commission nonetheless finds that the process it adopts here addresses the need for greater certainty for bidders in an auction, especially given the technical characteristics and expected deployments in the Upper 37 GHz band. First, requests by the Department are likely to be relatively

rare, as the Commission anticipates that most such operations can be accommodated in the Lower 37 GHz band.² Second, military use, if it cannot be accommodated in the Lower 37 GHz band, will be limited to military bases and ranges, for the purpose of defense applications or national security, and most likely will be in remote areas. Third, the technical characteristics of operations in this region of the spectrum, marked by high path losses and use of advanced antennas and adaptive power control, can minimize any significant impact on licensees' operations. Fourth, as noted above, the FCC, after consultation with potentially affected licensees, NTIA, and the Department, will determine whether the request for access can be accommodated without creating a significant risk of harmful interference to current or planned deployments by potentially affected non-Federal licensees. Although commenters suggest that the Department's needs can be accommodated by secondary market transactions with non-Federal licensees, the Commission does not find that it would be appropriate for secondary markets to be the sole mechanism for addressing future needs for defense and national security applications. Moreover, the same argument that AT&T raises to support the likelihood of successful Department negotiations on the secondary market—that the Department already has the practical ability to control the deployment of facilities on its military bases and ranges—also supports the likelihood that, under the process described above, non-Federal licensees could successfully negotiate coordination agreements with the Department regarding access to the Upper 37 GHz band at such military sites. Accordingly, the Commission believes that the process it establishes will protect winning bidders from harmful interference while enabling the Department to carry out operations in the Upper 37 GHz band for specific additional military sites on a limited basis.

² The Commission is continuing discussions with the Department of Defense on how to effectuate usage of the Lower 37 GHz band, and the Commission intends to take steps towards specifying rules for sharing the band within three months, including exploring whether giving priority access to military use of the 37.0–37.2 GHz band would facilitate usage of the Lower 37 GHz band.

18. The Commission disagrees with T-Mobile's assertion that the process it establishes for coordination of future Department access to the Upper 37 GHz band is inconsistent with the Administrative Procedure Act. First, the Commission provided ample notice in the Third FNPRM for its decisions. In the Third FNPRM, the Commission asked not only whether it should amend its rules to add more specific sites for Federal operations, but also whether it should establish a process that would permit Federal entities in the future to identify a limited number of additional sites on an as-needed basis. Second, T-Mobile's assertion that the process the Commission adopts is arbitrary and capricious is based on a description that does not match the process its adopt in light of the record generated, and its need to balance competing objectives under section 309(j) of the Act. The statutory factors the Commission promotes here include, e.g., "development and rapid deployment of new technologies, products, and services for the benefit of the public, including those residing in rural areas, without administrative or judicial delays;" and "efficient and intensive use of the electromagnetic spectrum" T-Mobile claims that "the proposed process would not include any guidelines for the location or number of additional military sites." However, the process the Commission adopts is limited to specific locations, *i.e.*, military bases and ranges, limits requests solely for the purpose of defense applications or national security, and only in those instances where the Department can justify that its proposed operations cannot be accommodated in the Lower 37 GHz band.

19. In addition, the Commission notes that the Department and the wireless industry are working together to advance spectrum-based technologies through various collaborative efforts, such as their participation in the National Spectrum Consortium and engagement in the Defense Advanced Research Projects Agency Spectrum Collaboration Challenge. Further, the Department and the wireless industry are working together to coordinate operations across many frequency bands, such as in the 3.5 GHz band. The Commission anticipates that those working relationships can facilitate successful coordination of operations in the 37 GHz band.

IV. FINAL REGULATORY FLEXIBILITY ANALYSIS

20. As required by the Regulatory Flexibility Act of 1980, as amended (RFA), an Initial Regulatory Flexibility Analysis (IRFA) was incorporated in the Third FNPRM released in June 2018 in this proceeding. The Commission sought written public comment on the proposals in the Third FNPRM, including comments on the IRFA. No comments were filed addressing the IRFA. This present FRFA conforms to the RFA.

A. Need for, and Objectives of, the Fifth Report and Order

21. In the Fifth Report and Order, the Commission authorizes FSS use of the 50.4-51.4 GHz band for individually licensed earth stations, which will allow FSS operators to provide additional capacity that can be used to provide faster and more advanced services to their customers. In authorizing FSS use of the 50.4-51.4 GHz band for individually licensed earth stations, the Commission will apply the licensing criteria it adopted for the 24.75-25.25 GHz band. Accordingly, in the Fifth Report and Order the Commission modify § 25.136 of its rules to include the 50.4-51.4 GHz band and make a minor conforming modification to § 25.130(b)(4) to include this newly modified rule section in the list of rules sections that FSS transmitting earth station applicants must comply with when seeking authorization in bands shared with UMFUS. Additionally, the Commission amends footnote NG65 to the U.S. Table of Allocations as proposed to include the 50.4-51.4 GHz band, making clear the relative interference protection obligations between the co-primary services.

22. With regard to Federal use in the 37 GHz band, the Commission establishes a process that accommodates the military's needs, while protecting the interests of non-Federal licensees in the Upper 37 GHz spectrum band. The Department may submit requests for access to the Upper 37 GHz band for specific additional military sites, such as military bases and ranges. Such requests must include a justification regarding why the proposed operations could not be accommodated in the Lower 37 GHz band. The FCC will review the request to assess any potential impact on non-Federal licensees, contacting the potentially affected licensees and facilitating direct coordination with the Department

and NTIA (including establishing a mechanism for appropriate notice to prospective future successors-in-interest to the affected licensees). The FCC will determine whether the request for access can be accommodated without creating a significant risk of harmful interference to current or planned deployments by potentially affected non-Federal licensees. This action will accommodate military needs while providing certainty to potential applicants as the Commission begins the auction process for the Upper 37 GHz band, the 39 GHz band (38.6-40 GHz band), and the 47 GHz band (47.2-48.2 GHz) later this year.

B. Summary of Significant Issues raised by Public Comments in Response to the IRFA

23. There were no comments filed that specifically addressed the proposed rules and policies presented in the IRFA.

C. Response to Comments by the Chief Counsel for Advocacy of the Small Business Administration

24. Pursuant to the Small Business Jobs Act of 2010, which amended the RFA, the Commission is required to respond to any comments filed by the Chief Counsel for Advocacy of the Small Business Administration (SBA), and to provide a detailed statement of any change made to the proposed rules as a result of those comments.

25. The Chief Counsel did not file any comments in response to the proposed rules in this proceeding.

D. Description and Estimate of the Number of Small Entities To Which the Proposed Rules Will Apply

26. The RFA requires the Commission to describe and to estimate the number of small entities that may be affected by the rules adopted herein. The RFA generally defines the term “small entity” as having the same meaning as the terms “small business,” “small organization,” and “small governmental jurisdiction.” In addition, the term “small business” has the same meaning as the term “small business concern” under the Small Business Act.” A “small business concern” is one which: (1) is

independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the SBA.

27. Small Businesses, Small Organizations, Small Governmental Jurisdictions. The Commission actions, over time, may affect small entities that are not easily categorized at present. The Commission therefore describes here, at the outset, three broad groups of small entities that could be directly affected herein. First, while there are industry specific size standards for small businesses that are used in the regulatory flexibility analysis, according to data from the SBA's Office of Advocacy, in general a small business is an independent business having fewer than 500 employees. These types of small businesses represent 99.9% of all businesses in the United States which translates to 28.8 million businesses.

28. Next, the type of small entity described as a "small organization" is generally "any not-for-profit enterprise which is independently owned and operated and is not dominant in its field." Nationwide, as of August 2016, there were approximately 356,494 small organizations based on registration and tax data filed by nonprofits with the Internal Revenue Service (IRS).

29. Finally, the small entity described as a "small governmental jurisdiction" is defined generally as "governments of cities, counties, towns, townships, villages, school districts, or special districts, with a population of less than fifty thousand." U.S. Census Bureau data from the 2012 Census of Governments indicate that there were 90,056 local governmental jurisdictions consisting of general purpose governments and special purpose governments in the United States. Of this number there were 37,132 General purpose governments (county, municipal and town or township) with populations of less than 50,000 and 12,184 Special purpose governments (independent school districts and special districts) with populations of less than 50,000. The 2012 U.S. Census Bureau data for most types of governments in the local government category show that the majority of these governments have populations of less than 50,000. Based on this data the Commission estimates that at least 49,316 local government jurisdictions fall in the category of "small governmental jurisdictions."

30. Wireless Telecommunications Carriers (except Satellite). This industry comprises establishments engaged in operating and maintaining switching and transmission facilities to provide communications via the airwaves. Establishments in this industry have spectrum licenses and provide services using that spectrum, such as cellular services, paging services, wireless internet access, and wireless video services. The appropriate size standard under SBA rules is that such a business is small if it has 1,500 or fewer employees. For this industry, U.S. Census Bureau data for 2012 show that there were 967 firms that operated for the entire year. Of this total, 955 firms had employment of 999 or fewer employees and 12 had employment of 1,000 employees or more. Thus, under this category and the associated size standard, the Commission estimates that the majority of wireless telecommunications carriers (except satellite) are small entities.

31. Fixed Microwave Services. Microwave services include common carrier, private-operational fixed, and broadcast auxiliary radio services. They also include the UMFUS, the mmW service, Local Multipoint Distribution Service (LMDS), the Digital Electronic Message Service (DEMS), and the 24 GHz Service, where licensees can choose between common carrier and non-common carrier status. At present, there are approximately 66,680 common carrier fixed licensees, 69,360 private and public safety operational-fixed licensees, 20,150 broadcast auxiliary radio licensees, 411 LMDS licenses, 33 24 GHz DEMS licenses, 777 39 GHz licenses, and five 24 GHz licensees, and 467 mmW licenses in the microwave services. The Commission has not yet defined a small business with respect to microwave services. The closest applicable SBA category is Wireless Telecommunications Carriers (except Satellite) and the appropriate size standard for this category under SBA rules is that such a business is small if it has 1,500 or fewer employees. For this industry, U.S. Census Bureau data for 2012 shows that there were 967 firms that operated for the entire year. Of this total, 955 had employment of 999 or fewer, and 12 firms had employment of 1,000 employees or more. Thus, under this SBA category and the associated standard, the Commission estimates that the majority of fixed microwave service licensees can be considered small.

32. The Commission does not have data specifying the number of these licensees that have more than 1,500 employees, and thus is unable at this time to estimate with greater precision the number of fixed microwave service licensees that would qualify as small business concerns under the SBA's small business size standard. Consequently, the Commission estimates that there are up to 36,708 common carrier fixed licensees and up to 59,291 private operational-fixed licensees and broadcast auxiliary radio licensees in the microwave services that may be small and may be affected by the rules and policies adopted herein. The Commission notes, however, that both the common carrier microwave fixed, and the private operational microwave fixed licensee categories includes some large entities.

33. Satellite Telecommunications. This category comprises firms "primarily engaged in providing telecommunications services to other establishments in the telecommunications and broadcasting industries by forwarding and receiving communications signals via a system of satellites or reselling satellite telecommunications." Satellite telecommunications service providers include satellite and earth station operators. The category has a small business size standard of \$32.5 million or less in average annual receipts, under SBA rules. For this category, U.S. Census Bureau data for 2012 shows that there were a total of 333 firms that operated for the entire year. Of this total, 299 firms had annual receipts of less than \$25 million. Consequently, the Commission estimates that the majority of satellite telecommunications providers are small entities.

34. All Other Telecommunications. The "All Other Telecommunications" category is comprised of establishments primarily engaged in providing specialized telecommunications services, such as satellite tracking, communications telemetry, and radar station operation. This industry also includes establishments primarily engaged in providing satellite terminal stations and associated facilities connected with one or more terrestrial systems and capable of transmitting telecommunications to, and receiving telecommunications from, satellite systems. Establishments providing Internet services or voice over Internet protocol (VoIP) services via client-supplied

telecommunications connections are also included in this industry.” The SBA has developed a small business size standard for “All Other Telecommunications,” which consists of all such firms with gross annual receipts of \$32.5 million or less. For this category, U.S. Census Bureau data for 2012 shows that there were a total of 1,442 firms that operated for the entire year. Of these firms, a total of 1400 firms had gross annual receipts of under \$25 million and 42 firms had gross annual receipts of \$25 million to \$49, 999,999. Thus, the Commission estimates that a majority of “All Other Telecommunications” firms potentially affected by its actions can be considered small.

35. Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing. This industry comprises establishments primarily engaged in manufacturing radio and television broadcast and wireless communications equipment. Examples of products made by these establishments are: transmitting and receiving antennas, cable television equipment, GPS equipment, pagers, cellular phones, mobile communications equipment, and radio and television studio and broadcasting equipment.” The SBA has established a size standard for this industry of 1,250 employees or less. U.S. Census Bureau data for 2012 shows that 841 establishments operated in this industry in that year. Of that number, 828 establishments operated with fewer than 1,000 employees, 7 establishments operated with between 1,000 and 2,499 employees and 6 establishments operated with 2,500 or more employees. Based on this data, the Commission concludes that a majority of manufacturers in this industry is small.

E. Description of Projected Reporting, Recordkeeping, and Other Compliance Requirements

36. The Commission expects the rules adopted in the Fifth Report and Order will impose new or additional reporting or recordkeeping and/or other compliance obligations on small entities as well as other applicants and licensees. FSS earth station applicants and licensees in the 50.4-51.4 GHz band will be subject to the reporting, recordkeeping, and compliance requirements applicable in the 24.75-25.25 GHz band. When they submit applications for authority to operate earth stations in the

50.4-51.4 GHz band, they will be required to demonstrate that the proposed earth stations comply with technical criteria designed to ensure that the earth stations would not unduly limit possible future terrestrial service. These demands are necessary to ensure that the proposed operations will comply with the technical rules, and not unduly preclude possible future terrestrial operation in the band and will require small businesses as well as other entities that intend to offer such satellite telecommunications services to use professional, accounting, engineering or survey services in order to meet these requirements. To attain consistency with the existing application of the Commission's rules, the reporting, recordkeeping, and other compliance requirements resulting from the Commission's actions in the Fifth Report and Order will apply to all entities in the same manner.

F. Steps Taken to Minimize the Significant Economic Impact on Small Entities, and Significant Alternatives Considered

37. The RFA requires an agency to describe any significant, specifically small business, alternatives that it has considered in reaching its approach, which may include the following four alternatives (among others): (1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance or reporting requirements under the rule for small entities; (3) the use of performance, rather than design, standards; and (4) an exemption from coverage of the rule, or any part thereof, for small entities.

38. Rather than creating a new framework for the licensing of FSS earth stations in the 50.4-51.4 GHz band, the Commission chose to apply the identical licensing criteria applicable to the 24.75-25.25 GHz band and adopt existing rule sections that FSS transmitting earth station applicants must comply with when seeking authorization in bands shared with UMFUS. These steps will minimize the significant economic impact on small entities by not increasing the cost of compliance with an entirely new set of rules and regulations. Moreover, to the extent an entity is already licensed and operating the 24.75-25.25 GHz band, they may have the processes and procedures and infrastructure in place to

facilitate compliance with the Commission's rules, and therefore may only incur minimal incremental costs to comply with the rules adopted for the 50.4-51.4 GHz band.

V. ORDERING CLAUSES

39. Accordingly, IT IS ORDERED, pursuant to sections 1, 2, 3, 4, 5, 7, 301, 302, 302a, 303, 304, 307, 309, and 310 of the Communications Act of 1934, 47 U.S.C. 151, 152, 153, 154, 155, 157, 301, 302, 302a, 303, 304, 307, 309, and 310, section 706 of the Telecommunications Act of 1996, as amended, 47 U.S.C. 1302, and § 1.411 of the Commission's Rules, 47 CFR 1.411, that this Fifth Report and Order IS HEREBY ADOPTED.

40. IT IS FURTHER ORDERED that the Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, SHALL SEND a copy of this Fifth Report and Order, including the Final Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administration.

41. IT IS FURTHER ORDERED that the amendments of the Commission's rules as set forth under Final Rules ARE ADOPTED, effective thirty days from the date of publication in the Federal Register. Section 25.136(e), (f), and (g) contain new or modified information collection requirements that require review by OMB under the PRA. The Commission directs the Bureau to announce the compliance date for those information collections in a document published in the Federal Register after OMB approval and directs the Bureau to cause § 25.136(h) to be revised accordingly.

List of Subjects in 47 CFR Parts 2, 25 and 30

Communications common carriers, Communications equipment, Reporting and recordkeeping requirements.

FEDERAL COMMUNICATIONS COMMISSION.

Marlene Dortch,

Secretary,

Office of the Secretary.

Final Rules

For the reasons discussed in the preamble, the Federal Communications Commission amends 47 CFR parts 2, 25 and 30 as follows:

PART 2—FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS

1. The authority citation for part 2 continues to read as follows:

Authority: 47 U.S.C. 154, 302a, 303, and 336, unless otherwise noted.

2. In § 2.106, the Table of Frequency Allocations is amended as follows:

- a. Revise page 60.

- b. In the list of non-Federal Government (NG) Footnotes, footnote NG65 is revised.

The revisions read as follows:

§ 2.106 Table of Frequency Allocations.

* * * * *

50.4-51.4 FIXED FIXED-SATELLITE (Earth-to-space) 5.338A MOBILE Mobile-satellite (Earth-to-space)	50.4-51.4 FIXED FIXED-SATELLITE (Earth-to-space) US156 MOBILE MOBILE-SATELLITE (Earth-to-space) G117	50.4-51.4 FIXED FIXED-SATELLITE (Earth-to-space) US156 MOBILE MOBILE-SATELLITE (Earth-to-space) NG65	Satellite Communications (25)
51.4-52.6 FIXED 5.338A MOBILE 5.547 5.556	51.4-52.6 FIXED US157 MOBILE		
52.6-54.25 EARTH EXPLORATION-SATELLITE (passive) SPACE RESEARCH (passive) 5.340 5.556	52.6-54.25 EARTH EXPLORATION-SATELLITE (passive) SPACE RESEARCH (passive) US246		
54.25-55.78 EARTH EXPLORATION-SATELLITE (passive) INTER-SATELLITE 5.556A SPACE RESEARCH (passive) 5.556B	54.25-55.78 EARTH EXPLORATION-SATELLITE (passive) INTER-SATELLITE 5.556A SPACE RESEARCH (passive)		Satellite Communications (25)
55.78-56.9 EARTH EXPLORATION-SATELLITE (passive) FIXED 5.557A INTER-SATELLITE 5.556A MOBILE 5.558 SPACE RESEARCH (passive) 5.547 5.557	55.78-56.9 EARTH EXPLORATION-SATELLITE (passive) FIXED US379 INTER-SATELLITE 5.556A MOBILE 5.558 SPACE RESEARCH (passive) US353 US532		
56.9-57 EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE 5.558A MOBILE 5.558 SPACE RESEARCH (passive) 5.547 5.557	56.9-57 EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE G128 MOBILE 5.558 SPACE RESEARCH (passive) US532	56.9-57 EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE 5.558 SPACE RESEARCH (passive) US532	
57-58.2 EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE 5.556A MOBILE 5.558 SPACE RESEARCH (passive) 5.547 5.557	57-58.2 EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE 5.556A MOBILE 5.558 SPACE RESEARCH (passive) US532		RF Devices (15) Satellite Communications (25)
58.2-59 EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive) 5.547 5.556	58.2-59 EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive) US353 US354		RF Devices (15)

NON-FEDERAL GOVERNMENT (NG) FOOTNOTES

* * * * *

NG65 In the bands 24.75-25.25 GHz, 47.2-48.2 GHz, and 50.4-51.4 GHz, stations in the fixed and mobile services may not claim protection from individually licensed earth stations authorized pursuant to 47 CFR 25.136. However, nothing in this footnote shall limit the right of Upper Microwave Flexible Use Service licensees to operate in conformance with the technical rules contained in 47 CFR part 30. The Commission reserves the right to monitor developments and to undertake further action concerning interference between Upper Microwave Flexible Use Service and Fixed-Satellite Service, including aggregate interference to satellite receivers, if appropriate.

* * * * *

PART 25 – SATELLITE COMMUNICATIONS

3. The authority citation for part 25 continues to read as follows:

Authority: 47 U.S.C. 154, 301, 302, 303, 307, 309, 310, 319, 332, 605, and 721, unless otherwise noted.

4. Amend § 25.130 by revising paragraph (b)(4) to read as follows:

§ 25.130 Filing requirements for transmitting earth stations.

* * * * *

(b) * * *

(4) Applicants for earth stations licensed in accordance with §25.136 must demonstrate that the transmitting earth stations will meet the relevant criteria specified in that section, including any showings required under §25.136(a)(4), (c), (d)(4), and/or (e)(4).

* * * * *

5. Amend § 25.136 by:

a. Revising the section heading;

b. In paragraph (c)(2), removing “table 1” and “Table 1” and adding in their place “table 2” and “Table 2”, respectively;

c. In paragraph (d)(4)(ii), removing “table 1” and “Table 1” and adding in their place “table 3” and “Table 3”, respectively;

d. Revising paragraphs (e), (f), and (g); and

e. Adding paragraph (h).

The revisions and addition read as follows:

§ 25.136 Earth Stations in the 24.75-25.25 GHz, 27.5-28.35 GHz, 37.5-40 GHz, 47.2-48.2, GHz and 50.4-51.4 GHz bands.

* * * * *

(e) Notwithstanding that FSS is co-primary with the Upper Microwave Flexible Use Service in the 24.75-25.25 GHz and 50.4-51.4 GHz bands, earth stations in these bands shall be limited to individually licensed earth stations. An applicant for a license for a transmitting earth station in the 24.75-25.25 GHz or 50.4-51.4 GHz band must meet one of the following criteria to be authorized to operate without providing any additional interference protection to stations in the Upper Microwave Flexible Use Service:

(1) The FSS licensee also holds the relevant Upper Microwave Flexible Use Service license(s) for the area in which the earth station generates a power flux density (PFD), at 10 meters above ground level, of greater than or equal to $-77.6\text{dBm/m}^2/\text{MHz}$;

(2) The earth station in the 24.75-25.25 GHz band was authorized prior to August 20, 2018; or the earth station in the 50.4-51.4 GHz band was authorized prior to **[INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**; or

(3) The application for the earth station in the 24.75-25.25 GHz band was filed prior to August 20, 2018; or the application for the earth station in the 50.4-51.4 GHz band was filed prior to **[INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**; or

(4) The applicant demonstrates compliance with all of the following criteria in its application:

(i) There are no more than two other authorized earth stations operating in the same frequency band within the county where the proposed earth station is located that meet the criteria contained in either paragraph (e)(1), (2), (3), or (4) of this section, and there are no more than 14 other authorized earth stations operating in the same frequency band within the Partial Economic Area where the proposed earth station is located that meet the criteria contained in paragraph (e)(1), (2), (3), or (4) of this section. For purposes of the requirement in this paragraph (e)(4), multiple earth stations that are collocated with or at a location contiguous to each other shall be considered as one earth station;

(ii) The area in which the earth station generates a power flux density (PFD), at 10 meters above ground level, of greater than or equal to $-77.6\text{ dBm/m}^2/\text{MHz}$, together with the similar area of any other earth station operating in the same frequency band authorized pursuant to paragraph (e) of this section, does not cover, in the aggregate, more than the amount of population of the county within which the earth station is located as noted in table 4 to this paragraph (e)(4)(ii):

Table 4 to Paragraph (e)(4)(ii)

Population within the County where earth station is located	Maximum permitted aggregate population within $-77.6 \text{ dBm/m}^2/\text{MHz}$ PFD contour of earth stations
Greater than 450,000	0.1 percent of population in county.
Between 6,000 and 450,000	450 people.
Fewer than 6,000	7.5 percent of population in county.

(iii) The area in which the earth station generates a PFD, at 10 meters above ground level, of greater than or equal to $-77.6 \text{ dBm/m}^2/\text{MHz}$ does not contain any major event venue, urban mass transit route, passenger railroad, or cruise ship port. In addition, the area mentioned in paragraph (e)(4)(ii) of this section shall not cross any of the following types of roads, as defined in functional classification guidelines issued by the Federal Highway Administration pursuant to 23 CFR 470.105(b): Interstate, Other Freeways and Expressways, or Other Principal Arterial. The Federal Highway Administration Office of Planning, Environment, and Realty Executive Geographic Information System (HEPGIS) map contains information on the classification of roads. For purposes of this paragraph (e)(4), an urban area shall be an Adjusted Urban Area as defined in section 101(a)(37) of Title 21 of the United States Code; and

(iv) The applicant has successfully completed frequency coordination with the UMFUS licensees within the area in which the earth station generates a PFD, at 10 meters above ground level, of greater than or equal to $-77.6 \text{ dBm/m}^2/\text{MHz}$ with respect to existing facilities constructed and in operation by

the UMFUS licensee. In coordinating with UMFUS licensees, the applicant shall use the applicable processes contained in §101.103(d) of this chapter.

(f) If an earth station applicant or licensee in the 24.75-25.25 GHz, 27.5-28.35 GHz, 37.5-40 GHz, 47.2-48.2 GHz and/or 50.4-51.4 GHz bands enters into an agreement with an UMFUS licensee, their operations shall be governed by that agreement, except to the extent that the agreement is inconsistent with the Commission's rules or the Communications Act.

(g) Any earth station authorizations issued pursuant to paragraph (a)(4), (c), (d)(4), or (e)(4) of this section shall be conditioned upon operation being in compliance with the criteria contained in the applicable paragraph.

(h) Paragraphs (e), (f), and (g) of this section contain new or modified information-collection and recordkeeping requirements. Compliance with these information-collection and recordkeeping requirements will not be required until after approval by the Office of Management and Budget. The Commission will publish a document in the Federal Register announcing that compliance date and revising this paragraph (h) accordingly.

PART 30 – UPPER MICROWAVE FLEXIBLE USE SERVICE

5. The authority citation for part 30 is revised to read as follows:

Authority: 47 U.S.C. 151, 152, 153, 154, 301, 303, 304, 307, 309, 310, 316, 332, 1302, unless otherwise noted.

6. Amend § 30.205 by:

a. Designating the table in paragraph (b) as table 4;

b. In newly designated table 4 to paragraph (b), revising the entry for “China Lake, CA” and adding an entry for “Edwards AFB, CA” immediately following the entry for “White Sands Missile Range, NM”; and

c. Adding paragraph (c).

The revisions and additions read as follows:

§ 30.205 Federal coordination requirements.

* * * * *

(b) * * *

Table 4 to Paragraph (b) - Coordination Areas for Federal Terrestrial Systems

Location	Agency	Coordination area (decimal degrees)
China Lake, CA	Navy	50 kilometer radius centered on latitude 35.614781 and longitude -117.454309
* * *	**	**
Edwards AFB, CA	Air Force	20 kilometer radius centered on latitude 34.922905 and longitude -117.891219
* *	* * *	* *

(c) In addition to the locations listed in table 4 to paragraph (b) of this section, requests may be submitted to the Commission for access to the 37.6-38.6 GHz band for specific additional military bases and ranges for the purpose of defense applications or national security when the proposed military operations cannot be accommodated in the 37-37.6 GHz band.

